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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/681,803	Applicant(s) CRUMP ET AL.	
	Examiner Justin R Fischer	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 and 34 is/are pending in the application.
- 4a) Of the above claim(s) 20-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 27-33 and 35 are cancelled per amendment submitted on November 13, 2003.

Election/Restrictions

2. Applicant's election with traverse of a bi-directional curing process for preparing a gel coat in Paper No. 11/13/2003 is acknowledged. The traversal is on the ground(s) that the gel coat of Invention II cannot be made by a process other than the process by the claim from which they depend. This is not found persuasive because a product defined by the process by which it can be made is still a product claim and can be restricted from the process if the examiner can demonstrate that the product as claimed can be made by another and materially different process. In this instance, the product can be made by another and materially different process, for example one in which no mold is present or one in which the bi-directional cure occurs simultaneously or one in which the curing is carried out via a heating oven as opposed to actinic radiation.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4, 5, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cordts (US 4,295,907, of record) and further in view of Aiba (US

Art Unit: 1733

4,087,182, newly cited) and Costello (US 5,180,611, newly cited). As best depicted in Figure 1, Cordts teaches a process for making glass fiber reinforced laminates comprising the steps of applying an uncured gel coat 20 to a nonporous mold or plastic film 17 and exposing the first and second surfaces of the gel coat to actinic radiation (Column 5, Lines 55-65). In this instance, Cordts is generic to the concept of placing ultraviolet lamps (actinic radiation) above and below the gel coat- the reference is silent as to the specific arrangement of the respective actinic radiation sources. One of ordinary skill in the art at the time of the invention would have found it obvious to stagger the sources such that a cure gradient is established since such an arrangement is well known and extensively used, as shown for example by Aiba (Figure 1) and Costello (Figure 1). In particular, Aiba and Costello recognize that a staggered arrangement is commonly employed when multiple radiation sources are provided above and below a given substrate. Thus, since Cordts is only generic to the use of multiple radiation sources above and below a gel coat, one of ordinary skill in the art at the time of the invention would have looked to similar arrangements (Aiba and Costello) in which multiple radiation sources are provided above and below a given polymerizable layer. It is further noted that applicant has failed to provide a conclusive showing of unexpected results to establish a criticality for a staggered arrangement (regarding the radiation sources)- the purported benefits of low warpage, absence of alligating, and improved gloss are not specific to a staggered relationship but are a result of imparting a bi-directional cure, which is expressly suggested by Cordts.

Regarding claim 2, in an analogous manner to the claimed invention, the mold of Cordts is a transparent casting film. It is noted that the "casting plastic films" described and depicted by the claimed invention are analogous to those described and depicted by Cordts. In particular, the language "casting plastic film" does not require an embossed pattern or cavity in the carrier film. If applicant intends the language to require such a construction, one of ordinary skill in the art at the time of the invention would have found it obvious to impart a pattern or cavity to the carrier film of Cordts to result in a desired shape or object (versus being applied to smooth carrier film).

With respect to claims 4 and 5, the process of Cordts includes the use of ultraviolet radiation (Column 2, Lines 40-45).

Regarding claim 8, the uv-curable gel coat resin of Cordts can be one of several resins and is typically formed of acrylate resins (Column 1, Lines 60-67).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cordts, Aiba, and Costello as applied to claim 2 above and further in view of Borrell (US 3,655,483, of record). In describing the casting film, Cordts requires that the film is a transparent carrier film and suggests that cellophane is one possible material. While Cordts fails to expressly describe the use of a polyester material, one of ordinary skill in the art at the time of the invention would have found it obvious to use such a material in the process of Cordts since polyester materials are well recognized as being suitable carrier films and providing a transparent surface for exposure to ultraviolet radiation. For example, Borrell describes a similar process in which the carrier film or substrate-support is formed of either regenerated cellulose or terephthalic polyester (Column 2,

Art Unit: 1733

Lines 56-58). In the specific examples of Borrel (Columns 3 and 4), Mylar (terephthalic polyester) is used as the carrier film in an analogous manner to the claimed invention.

6. Claims 6, 7, 9-15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cordts, Aiba, and Costello as applied in claim 2 above and further in view of Russell (US 4,338,269, of record). In describing the ultraviolet radiation source, Cordts suggests the use of ultraviolet lamps (Column 5, Lines 20-25). While Cordts fails to expressly suggest the use of mercury lamps, this source of ultraviolet radiation is extremely well known and extensively used when uv-curable formulations are included in a given laminate, as shown for example by Russell (Column 5, Lines 17-21). In particular, Russell states that mercury vapor lamps are the preferred source of ultraviolet radiation. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to include mercury lamps as the ultraviolet sources in the process of Cordts.

Regarding claim 7, as previously stated, Cordts suggests the use of ultraviolet radiation sources above and below the gel coat.

With respect to claim 9, Cordts suggests that typical gel coats include acrylates (Column 1, Lines 63-67).

Regarding claim 10, the process of Cordts further comprises the application of a reinforcing lamination (layer 34: combination of fibers 25 and resin from tank 27).

With respect to claim 11, Cordts suggests that the gel coat can be formed of any of the addition polymerizable resinous compositions, including unsaturated polyester resin syrups (Column 4, Lines 56-60). In describing the resin of the reinforcing

lamination, Cordts describes the use of unsaturated polyester syrup. Thus, the reference recognizes the use of the same resin in the gel coat and the reinforcing lamination (would be dependent on the specific product being manufactured).

Regarding claim 12, the second surface of the reinforcing lamination (that which is exposed to the environment) is exposed to heat in a heating zone to achieve substantially complete polymerization of the gel coat film and the unsaturated polyester syrup of said reinforcing lamination (Column 3, Lines 25-30). While the specific heating/curing means is not disclosed, one of ordinary skill in the art at the time of the invention would have found it obvious to use actinic radiation since the relevant resin formulations have been previously described by Cordts as being uv-curable. In particular, the gel coat has already been partially cured via exposure to ultraviolet radiation. As such, the use of actinic radiation in the heating zone of Cordts to heat/cure the gel coat resin and the resin of the reinforcing lamination would have been well within the purview of one of ordinary skill in the art at the time of the invention.

With respect to claims 13 and 14, Cordts suggests the use of a cover plastic film 31 (same material as casting film) over the reinforcing lamination (Column, Lines 20-25).

Regarding claim 15, the cover plastic film 31, which is transparent, is disposed over the reinforcing lamination prior to the heating zone.

With respect to claims 17 and 18, Cordts discloses a method in which a cover plastic film 31' disposed over the gel coat film prior to cure (before heating zone in which complete cure is realized). As to claim 18, although Cordts fails to expressly

suggest a take-up reel, one of ordinary skill in the art at the time of the invention would have readily appreciated such a step since it is well known to store laminates in roll form prior to use.

7. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cordts, Aiba, and Costello as applied to claim 1 above and further in view of Gupta (US 5,702,819, of record). Cordts teaches a method of applying a gel coat to a casting plastic film and exposing the gel coat to ultraviolet radiation to at least partially cure said gel coat. While Cordts fails to suggest the use of thermal energy to augment this process, the use of dual cure systems are well known and extensively used in a variety of industries depending on the specific product being manufactured (e.g. cost issues, desired efficiency). For example, Gupta, in describing a gel coat that is applied to a mold, states, "some materials can be cured by a combination of heat and ultraviolet light" (Column 6, Lines 49-50). Thus, the use of thermal energy to augment the process of Cordts (use of thermal energy and ultraviolet radiation) would have been obvious to one of ordinary skill in the art at the time of the invention.

8. Claims 1-9 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meoni (US 4,734,143, of record) and further in view of Cordts, Aiba, and Costello. As best depicted in Figure 1, Meoni teaches a method of forming a composite ribbon comprising the steps of applying a gel coat or polymerization composition (at reference character 5) to a mold or film P1 and exposing said gel coat to actinic radiation (uv radiation and infrared radiation) in a polymerization tunnel 10 (Column 3, Lines 33 – Column 4, Line 8). While Meoni fails to expressly describe the use of radiation sources

above and below the gel coat (to impart a bi-directional cure), one of ordinary skill in the art at the time of the invention would have found it obvious to use radiation sources above and below the gel coat of Meoni since such an arrangement is extensively used in a variety of designs, including the application and curing of gel coats, and is recognized as an equivalent to an arrangement in which only a single radiation source (above or below is use). By using multiple radiation sources (above and below), one of ordinary skill in the art would expect the curing time to be reduced and the efficiency or evenness of curing to be improved. Cordts (Column 5, Lines 55-62) has been applied to demonstrate the well-known use of multiple radiation sources above and below a given curable composition. Furthermore, Aiba and Costello recognize that multiple radiation sources are commonly staggered when they are disposed above and below a given substrate, such that a cure gradient is formed. One of ordinary skill in the art at the time of the invention would have found it obvious to stagger the radiation sources since such an arrangement is well known in processes involving curing via actinic radiation. It is emphasized that Cordts is only generic to the concept of arranging radiation sources above and below a give substrate- one of ordinary skill in the art at the time of the invention would have been expected to look to similar processes using multiple radiation sources, such as Aiba and Costello. It is further noted that applicant has failed to provide a conclusive showing of unexpected results to establish a criticality for a staggered arrangement (regarding the radiation sources).

Art Unit: 1733

Regarding claim 2, Meoni states, "the two transparent films P1 and P2 consequently constitute the wall of a polymerization cell or mold" (Column 3, Lines 64-66).

With respect to claim 3, Meoni teaches the preferred use of polyester films (e.g. polyethyleneterephthalate- Column 3, Lines 54-56).

Regarding claims 4-6, Meoni describes the use of ultraviolet radiation (Column 4, Lines 3-8). Also, with specific respect to claim 6, although Meoni fails to expressly suggest the use of mercury lamps to provide the uv radiation, one of ordinary skill in the art at the time of the invention would have readily appreciated the use of mercury lamps since they are extensively used for applying uv radiation. It is noted that Borrel describes the use of mercury lamps to provide uv radiation (Column 3, Lines 35-40).

With respect to claims 8 and 9 the gel coat of Meoni is defined as an acrylate resin (Column 2, Lines 39-41).

Regarding claims 16 and 17, Meoni applies a transparent cover plastic film P2 before exposing the gel coat to the first source of actinic radiation.

With respect to claims 18 and 19, the gel coat laminate is coiled or taken-up on a roller 13 for storage, as best depicted in Figure 1.

Response to Arguments

9. Applicant's arguments with respect to claims 1-19, 27-32, 34, and 35 have been considered but are moot in view of the new ground(s) of rejection. Applicant argues that the prior art references of record, particularly Cordts, fail to appreciate the benefits of bi-

directional curing and furthermore, the processes of the references do not establish a cure gradient (results from staggered arrangement).

First, while Cordts fails to expressly recognize a benefit for bi-directional curing, the reference does positively suggest the use of bi-directional curing to affect a desired cure of a gel coat. In regards to Cordts, the question is whether or not it would have been obvious to establish a cure gradient as a result of staggering the respective radiation sources. As previously noted, Cordts generically suggests a process in which actinic radiation is provided above and below a gel coat- the reference is completely silent as to the specific arrangement of the respective sources. In arranging the multiple radiation sources of Cordts, one of ordinary skill in the art at the time of the invention would have looked to additional process in which multiple radiation sources are provided. Aiba and Costello each have radiation sources above and below a given substrate, wherein said sources are staggered along the direction of said substrate. In an analogous manner to the claimed invention, such an arrangement necessarily forms a cure gradient in the thickness direction of the substrate. Thus, one of ordinary skill in the art at the time of the invention would have found it obvious to include a staggered arrangement in the multiple source assembly of Cordts absent any conclusive showing of unexpected results. It is noted that applicant's purported benefits of low warpage, absence of alligatoring, and improved gloss are not specific to a staggered arrangement but are a result of a bi-directional cure, which is achieved via a simultaneous or staggered arrangement.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rahman (EP 0660148) discloses a method of curing a radiation curable composition in which a staggered arrangement for the radiation sources is contemplated. The reference suggests that such an arrangement leads to uneven curing and ultimately results in a warped substrate (Column 5, Lines 44-57).

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(571) 272-1215**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone

Art Unit: 1733


number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Justin Fischer

March 12, 2004



JEFF H. AFTERGUT
PRIMARY EXAMINER
GROUP 1300